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AUTHOR Sugahara, Motomi
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ABSTRACT

In light of college students' high level of knowledge about Acquired Immune Deficiency Syndrome (AIDS) and their persistence in engaging in risky sexual behaviors, this paper reviews the current literature on college students' level of AIDS knowledge, their patterns of behavior, factors essential in designing effective AIDS education programs, and strategies to help students adopt safer sexual practices. The review of AIDS knowledge and sexual behavior found a serious gap between students' degree of knowledge concerning AIDS and the modification of their behavior to prevent HIV infection. An examination of effective education programs found that health educators as well as programs on campuses need a great deal of support from their respective educational institutions and that students may remain detached from the urgency of the current crisis because institutions fail to recognize such urgency themselves. A look at the best approaches to closing the knowledge-behavior gap found that perceived peer norms have been identified as an influential element and that the inclusion of a peer education component that modified college students' perceived peer norms may be the intervention method of choice. (Contains 64 references.) (JB)

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SEXUAL BEHAVIOR OF COLLEGE STUDENTS IN THE AGE OF AIDS: STRATEGIES FOR PREVENTIVE EDUCATION

A Doctoral Research Paper

Presented to

the Faculty of the Rosemead School of Psychology

Biola University

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Psychology

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by

Motomi Sugahara

November, 1995

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STRATEGIES FOR PREVENTIVE EDUCATION

by

Motomi Sugahara

APPROVED:

Joan H. Jones, Psy.D. Date 12-13-95
First Reader

[signature] Date 12/13/95
Second Reader

APPROVED:

[signature]
Dean

12-13-95
Date

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ABSTRACT

SEXUAL BEHAVIOR OF COLLEGE STUDENTS IN THE AGE OF AIDS: STRATEGIES FOR PREVENTIVE EDUCATION

by

Motomi Sugahara

College students engage in sexual behaviors that place them at risk of HIV infection in spite of their high level of knowledge about AIDS. This paper reviews the current literature on college students' level of AIDS knowledge and the patterns of their sexual behavior. Factors essential in designing effective AIDS education programs in accordance with major health education theories are identified, and strategies to help the students adopt safer sexual procedures are described. In particular, educational programs containing a peer education component seem to be the most promising method of AIDS prevention for college students.

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SEXUAL BEHAVIOR OF COLLEGE STUDENTS IN THE AGE OF AIDS: STRATEGIES FOR PREVENTIVE EDUCATION

Introduction

The alarming news on sexually transmitted disease (STD) is that the number of cases in the United States is on the rise. U.S. Department of Health and Human Services' 1989 statistics (Centers for Disease Control and Prevention [CDC], 1990) show that an estimated 12 million cases of STDs are reported each year. Two-thirds of these cases are found among young people under 25 years of age with the highest rates of many STDs occurring in sexually active 15 to 19 year-olds. Unwanted pregnancies, another indicator of unsafe sexual practices, continue to be a matter of concern for health service professionals on many high school and college campuses. Millions of hours and dollars have been invested in an attempt to find a solution to the related problems of unwanted pregnancy and STDs among young adults (Manning, Barenberg, Gallese, & Rice, 1989).

Acquired immunodeficiency syndrome (AIDS) is a STD that has greatly concerned health service professionals on many college campuses since the mid-1980's. In the United States, HIV infection became the leading cause of death for men aged 25-44 years and the fourth leading cause of death for women in this age group in 1992 (CDC, 1993a). It has been reported that 42% of males and 48% of

females diagnosed with AIDS are between the ages of 20 and 34 (CDC, 1993b). The incubation period of human immunodeficiency virus (HIV), from the infection by the virus to the onset of symptoms, is known to be about five to ten years (Fielstein, Fielstein, & Hazlewood, 1992). Hence, it can be presumed that many of these individuals were infected in their teens or early twenties. In fact, recent estimates suggest that up to three of every 1,000 college students may be currently infected with HIV (Blonna, Hayden, & Milcetic, 1991). Thus, there is a serious concern that college age adults and adolescents may become the next subgroup to be greatly impacted by HIV (Scollay, Doucett, Winterbottom, 1992). Designing effective education programs for this subpopulation is an essential task for health educators.

Research indicates that many college students experiment with drugs, engage in sexual activities at relatively high frequency, practice high-risk sexual behavior, and have multiple sex partners. The campus environment, therefore, is conducive to the continued spread of various sexually transmitted diseases, including AIDS (Baldwin & Baldwin, 1988; MacDonald et al., 1990; McDermott, Hawkins, Moore, & Cittadino, 1987). Therefore, university students may potentially become a group at higher risk for HIV and AIDS than the general population.

This paper will present a summary of the current literature on college students' level of AIDS knowledge and their sexual behavior patterns. Research demonstrates that despite their high level of AIDS knowledge, college students are

engaging in sexual behaviors that place them at risk of HIV infection. Various health education theories will be presented and factors essential for the adoption of recommended health behavior will be noted. The developmental issues of college students that interfere with the efficacy of current AIDS education programs and a strategy to counter them will be identified. Finally, recommendations will be made in order to improve the effectiveness of AIDS education programs.

AIDS Knowledge and Sexual Behavior

Research indicates that college students in general are highly knowledgeable about AIDS. However, most students do not practice safer sex procedures that would protect them from HIV infection (Baldwin & Baldwin, 1988). Thus, it seems apparent that knowledge does not translate into practice. In this section, college students' methods of gaining AIDS information is described and areas of misinformation identified. In addition, the risky nature of students' sexual behavior patterns is demonstrated.

AIDS Knowledge

Although earlier studies (DiClemente, Zorn, & Temoshok, 1986; Price, Desmond, & Kukulka, 1985) indicated significant deficits in AIDS knowledge among young adults, the results of more current studies support the trend that AIDS knowledge is increasing across time in this population (Adame, Taylor-Nicholson, Wang, & Abbas, 1991; Fisher & Misovich, 1990). Fielstein et al.

(1992) found that their sample of first year college students possessed substantial knowledge about AIDS--definition, disease description, epidemiology, transmission, symptoms, diagnosis, and disease course. Furthermore, the students believed that they possessed moderate to high levels of AIDS knowledge.

Information sources. Most college students gain knowledge of AIDS passively. Surveys indicate that information about AIDS is primarily obtained by students through the media via TV, radio, newspapers, and magazines (Fielstein et al., 1992; Jacobs, 1993). National Audience Demographics and the Radio Advisory Board reported that each week teenagers engage in about 24 hours of television watching and approximately 18.5 hours of radio listening (Adame et al., 1991). This passive approach to information collection on AIDS is more prevalent among males. Females tend to obtain knowledge about AIDS and HIV through interpersonal discussion as well as through passive means (Fielstein et al., 1992).

A minority of student samples reported classroom experience and small group discussion as primary sources of information (Fielstein et al., 1992; Jacobs, 1993). In general, college students seem to prefer a more anonymous setting and avoid one-on-one or intimate settings to gain information on AIDS. Thus, small group discussions and information gathering through media where students are not in the spotlight (for example, educational films or panel presentations) are preferred. Adame et al.'s (1991) study indicated 66% of college students surveyed preferred to learn about AIDS from physicians if gathering of AIDS information were to take place in an interpersonal context. Other preferred information

sources were: an AIDS patient (10%), peers (8%), and teachers (7%). Individual counseling does not appear to be a preferred way to educate students about AIDS.

Although AIDS information is made readily available through the widespread distribution of educational materials such as AIDS brochures, most college students gain their AIDS knowledge more passively. Students may feel uneasy or threatened by a brochure with "AIDS" in the title, and they are reluctant to actively seek out such educational material. Some students may be concerned about being perceived as a member of one of the original high-risk groups (gay men and intravenous drug users) if they actively seek out AIDS education materials (Caruso & Haig, 1987).

However, there is evidence of an increase in college students' active involvement in information-seeking behavior. Fisher and Misovich (1990) found that among the sexually active students at one university, 39% of the males and 35% of the females said they had sought out such information during the previous year. This is an increase from 15% overall in 1987 and three percent in 1986. Students' intentions to seek out information about AIDS in the future were also greater in 1988. Forty-one percent of the males and 42% of the females said they intended to seek out preventive information during the coming year. This percentage shows an increase over the 18% overall in 1987 and 14% in 1986.

One study found no significant differences in knowledge about AIDS between first year college students who had received formal AIDS education and

those who had not. This finding suggests that students are knowledgeable about AIDS in general and the mass media (TV, magazine, books, etc.) appears to have played a significant role in educating them about the AIDS epidemic (Adame et al., 1991).

Misconceptions. Despite high levels of general AIDS knowledge, significant knowledge gaps exist. Adame et al. (1991) found that many first year students misunderstood the risk of some nonsexual and sexual modes of transmission. Most students could correctly endorse a statement such as "AIDS is not transmitted through casual contact," but they were unsure of the risk of transmission in common day-to-day behaviors in a college environment. First year students erroneously believed kissing (17%) and sharing a comb or toothbrush (27%) were high-risk behaviors. Twelve percent of the students were not aware of the high-risk nature of anal intercourse for HIV infection. In addition, some students incorrectly identified the possibility of HIV transmission through blood donation (56%), via insects (52%), and from toilet seats (33%) (Bellingham & Gillies, 1993). Thus, providing students with accurate information about disease transmission does not necessarily dispel misconceptions or give students the ability to correctly judge the actual risk of activities where there may be contact with bodily fluids (DiClemente, Forrest, Mickler, & Principal Site Investigators, 1990; Fielstein et al., 1992).

Sheehan (1991) notes three possible explanations why students perceive HIV to be more contagious than it actually is. First, the misperception may be a

result of early-1980's confusion over exact HIV transmission mechanisms and various rumors speculating the means of transmission. Second, confusing and euphemistic medical jargon such as HIV transmitted through "bodily fluids" could enhance the belief that HIV is highly contagious. Third, the media often cites statistics on the spread of AIDS and reports individual AIDS cases; the media's frequent reporting of AIDS cases may contribute to the misperception of the degree of contagiousness of HIV. These factors may contribute to a conclusion that AIDS is much more common than it actually is and HIV must be as easy to transmit from one person to another as other viruses such as influenza (Sheehan, 1991).

The implications of AIDS knowledge gaps or erroneous beliefs about the level or risk of various behaviors may be quite serious. Such misconceptions can increase individual risk and create unnecessary fear and anxiety rather than focus attention on identified means of transmission. Misconceptions about AIDS can have broader social implications as well. Some students may refuse to attend classes or share a residence with HIV seropositive students. A belief that all homosexual activity spreads AIDS may result in increased homophobic attitudes or discrimination against homosexuals in the college environment. Refusal to donate blood due to fears of HIV infection may impact the already low blood supply (DiClemente et al., 1990; Fielstein et al., 1992). Even among the highly educated, such as college students, feelings of confusion, apprehensiveness, and distrust may be caused by the saturation of news reports and heated political

debates over AIDS in the media.

Misconceptions about HIV and AIDS remain for many college students, partly due to their passive style in gathering accurate information which would dispel the myths. Therefore, the common misconceptions described above must be treated as a distinctly separate issue by AIDS education programs, and educators should not assume that the provision of AIDS information will automatically address such misconceptions (DiClemente et al., 1990).

Knowledge-Behavior Gap

Despite their high levels of basic knowledge about HIV and AIDS, college students are not necessarily translating their knowledge into behavior by taking appropriate actions to prevent HIV infection. There are different ways in which college students can place themselves at risk of HIV infection. Having multiple partners, becoming involved with unfamiliar sex partners, having unprotected sex, and using alcohol and drugs have all been cited as factors that increase the chances of becoming infected with HIV (Baldwin & Baldwin, 1988).

Multiple sex partners. Sawyer and Beck (1991) found that 65% of first year college students in their sample were already sexually active when they arrived at the university. One-third of this sexually active group reported having had two or three different sexual partners in the past year, and another 16% reported having had six or more sexual partners. Blonna et al. (1991) found that in the previous year, 79% of their student sample reported having had some kind of sexual intercourse an average of 2.8 times per month. In this study the average

number of different sexual partners in the past year was 2.3. Finally, Baldwin and Baldwin (1988) found 54% of their college student sample having had a new sexual partner within the last three months, and eight percent had been sexually active with three or more partners during the last three months.

To assess changes in AIDS-related attitudes and behavior, Fisher and Misovich (1990) studied a series of cross-sectional samples taken annually at a northeastern university from 1986 to 1988. The samples were comparable between years based on demographic data. Over the three years, Fisher and Misovich found that there was a significant increase in the number of students who reported limiting the number of their sexual partners. In 1988, 37% of the sexually active students reported having limited their number of sexual partners to reduce their risk of HIV infection. However, the same study found that students' actual sexual activity level contradicted their self-report. Specifically, the students in this study believed that they were limiting the number of sexual partners in response to the current AIDS crisis, but the results showed that 46% of the 1988 sample reported having two or more sexual partners during the last year while the percentages from 1987 and 1986 samples were 34% and 36%, respectively. The reports of limiting partners may be a reflection of socially desirable responses in the time of AIDS crisis. The researchers concluded that, overall, the behavioral data suggest that students are actually more likely to be engaging in sexual intercourse and are having more sexual partners than before.

Unfamiliar sex partners. There is evidence that students are engaging in

sex with partners whom they hardly know, thus increasing the risk of HIV infection. Twenty-five percent of the sexually active students had intercourse with people they knew only slightly, and 30% with partners they knew only moderately (Fisher & Misovich, 1990).

Sexually active students often fail to ask about the sexual history and HIV status of partners who are known moderately or slightly to them. While it was reported that women were significantly more likely than men to take precautions about sexual encounters and to ask their partners about their past sexual activities (Baldwin & Baldwin, 1988), many do not feel comfortable asking their partners to assess the risk before engaging in sexual intercourse (Goertzel & Bluebond-Langner, 1991).

Unprotected sex. It has been established that college students are having sexual intercourse with multiple partners, and they are having sex with partners they do not know well or whose sexual history or HIV status is unknown. This situation raises the question, are the students at least practicing protected sex using condoms? Despite the knowledge that condom use is an effective means of preventing HIV infection, a range exists in the frequency of students' condom use, and the frightening results of this are reported in a number of studies.

Some studies have shown only a small percentage of sexually active students (8% to 26%) use condoms every time they engage in intercourse (Blonna et al., 1991; DiClemente et al., 1990; MacDonald et al., 1990). Roscoe and Kruger (1990) found that 37% of the sexually active heterosexual students

surveyed had never used condoms in the past year. Less than 20% of students surveyed by Baldwin and Baldwin (1988) used condoms 75% or more of the time. In a survey of sexually active Canadian university students, MacDonald et al. (1990) found 21% of the men and nine percent of the women had 10 or more sex partners. Regular condom use was reported by only 21% of the men and eight percent of the women.

Although there is an inverse correlation between the level of AIDS knowledge and the degree of difficulty an individual perceives in practicing safer sex (Manning et al., 1989), knowledge has a limited effect on the way that college students practice safer sex (Roscoe & Kruger, 1990). Students' sporadic efforts at protection through condom use place them at risk for infection with HIV as well as pregnancy. Why do students fail to use condoms every time they have sex despite their awareness that condoms are an effective tool for preventing HIV infection? It has been found that one's attitude toward condom use is related to the actual condom use.

Severn (1990) surveyed 689 college students and found that individuals with little or no sexual experience (zero to one year) had more positive attitudes about condoms and were more likely to carry and use, or intend to use, them than were individuals with extensive sexual experience. Those with extensive sexual experience generally did not have positive attitudes toward condoms and they were least likely to use them. Caruso and Haig (1987) suggest that individuals with more sexual experience may have formed a strong attitude against condoms

based on their negative experiences with condom use. This attitude may have been formed before the AIDS epidemic, and these individuals may view the current crisis with skepticism and be unwilling to accept and respond to the present situation appropriately.

Alcohol and drug use. Students are also at risk for contracting HIV and AIDS because of their propensity to experiment with recreational drugs and alcohol which can lead to impaired judgment concerning safer sex procedures (Sheehan, 1991). The use of alcohol and drugs is often a part of sexual experience among college students. This was found true for 61% of the respondents in one survey (Scollay et al., 1992). Of this sample, 13% engaged in sexual behavior accompanied by alcohol and drug use "all" or "most of" the time. Fisher and Misovich (1990) found that among the sexually active students 29% of males and 32% of females engage in sexual activity under the influence of alcohol 50% of the time or more.

Several risk factors were found to correlate with the extent of alcohol use in students' sexual activity. The total number of sexual partners during the previous year, the number of partners whom one knew only moderately well, and the number of partners whom one knew only slightly all correlated positively with the extent of alcohol use in sexual activity (Fisher & Misovich, 1990). Furthermore, alcohol and drugs seem to alter students' intentions to practice safer sex (Ross & Rosser, 1989), and heavier drinkers were found to avoid using condoms during sex and were more likely to become sexual with someone than if

they were sober (McEwan, McCallum, Bhopal, & Madhok, 1992). While students were aware of the increased risk in using alcohol and/or drugs in sexual situations, only 58% were willing to limit their substance intake (Fisher & Misovich, 1990).

Summary

The studies on sexual behaviors of college students indicate that there is a serious gap between students' degree of knowledge concerning HIV/AIDS and the modification of their behavior to prevent HIV infection. Students continue to have multiple sex partners even though they know that limiting the number of sexual partners reduces the risk of HIV infection. They become sexual with individuals whose sexual history or HIV status is unknown even when educated regarding this risk. They do not always use condoms in spite of AIDS education regarding the need for protection. Alcohol and drug use are known by students to increase risky sexual behavior, yet only about half of them are willing to limit their use of these substances. It appears that current AIDS education programs available to college students have limited effectiveness.

Effective AIDS Education: Necessary Elements

It is important to differentiate AIDS information from AIDS education. Green and his colleagues (1980) stated, "Health education is a process that bridges the gap between health information and health practices. Health education motivates the person to take the information and do something with it--to keep himself healthier by avoiding actions that are harmful and by forming habits that

are beneficial" (p. 4). It appears that most of the AIDS education programs currently available offer "AIDS information," and not necessarily "AIDS education." It is the salience of particular beliefs and attitudes that dictates whether information is translated into behavioral modification. Rather than information influencing attitudes, attitudes mediate the internalization of information (Bloom et al., 1964; Janz & Becker, 1984). In this section, elements that are necessary to make impact on college students' attitude toward AIDS and AIDS education will be investigated.

Theoretical Base

In an effort to describe the elements that must be present if health knowledge were to be followed by the recommended behavior, several health education theories and models have been developed. The Health Belief Model, the Taxonomy of Educational Objectives, the Theory of Reasoned Action, and the PRECEDE Model of Health Education will be briefly described here.

The Health Belief Model (Janz & Becker, 1984) suggests that variables influencing the adoption of health-related behaviors are attitudinal. The attitudes include an individual's perception of his or her susceptibility to the illness, perception of the severity of the illness, perception of the efficacy of the action necessary to avoid the infection or health problem, and assessment of the relative costs and benefits of adopting the appropriate preventive health behaviors.

The Taxonomy of Educational Objectives (Bloom, Krathwohl, & Masia, 1964) proposes that education is comprised of three sequential elements: the

affective, the cognitive, and the psychomotor. The three elements correspond to attitudes and emotions toward the subject, information about the subject, and the ability to adequately perform the tasks associated with the subject. The theory asserts that unless the modification of the affective or attitudinal domain takes place, information and knowledge will not be internalized and the health-related behaviors not adopted.

The Theory of Reasoned Action (Ajzen & Fishbein, 1980) suggests that human behavior can be predicted and explained in terms of the relationships between attitudes, intentions, and behavior. According to this theory, an individual's intentions are the best predictors of health-related behavior, and they are based on the individual's attitudes to that behavior and on his or her perceptions of the social pressure to perform or not perform the behavior in question.

Finally, the PRECEDE Model of Health Education (Green, Kreuter, Deeds, & Partridge, 1980) identifies factors contributing to behavioral change in response to health problems: predisposing factors, enabling/disenabling factors, and reinforcing factors. The predisposing factors consist of one's beliefs, attitudes, values, and perceptions that can facilitate or hinder personal motivations for change. Enabling/disenabling factors are barriers created primarily by societal forces or systems such as limited facilities, inadequate personnel, or restrictive laws or statues. Reinforcing factors are feedback from others that encourage or discourage one's behavioral change. The behavioral change does not take place

unless attitudes, which motivate one to perform or not perform health-related behavior, are changed.

Information and knowledge are only a small part of effective health education. The notion of "the more, the better" is fallacy; more information on AIDS does not necessarily lead to more positive outcome (Ross & Rosser, 1989). All models reviewed above note this point and emphasize attitudinal change as necessary to one's motivation to adopt health-related behaviors.

The factors identified by the four health education models can be broadly categorized and applied to AIDS education as indicated below. They are essential components in addressing the necessary changes in AIDS education strategies and in designing future AIDS education programs.

1. Information about AIDS, including appreciation for its severity (already addressed in the preceding section).

2. Support from an administrative system.

3. Students' attitudes that impact their receptivity to recommended behaviors, including their perceived susceptibility to AIDS, their attitudes toward AIDS and homosexuality, and their intentions and abilities regarding prevention.

4. Peer support and education.

Administrative Support

Green et al. (1980) have identified in the PRECEDE Model of Health Education that one category of factors contributing to behavioral change in a response to health problem is enabling/disenabling factors. A societal system that

impacts the modification of health related behaviors needs to be identified and empowered. For college students, the administration of their colleges represents such a system. Therefore, providing an effective AIDS education program requires health educators to break through barriers that may exist at the institutional level and permeate the students' environment with adequate support for behavioral modification.

Overcoming institutional resistance. Existence of institutional barriers against AIDS education programs may be attributed to the highly stigmatized nature of the disease. The topic of AIDS and related programming may elicit discomfort at different levels of the institution--the administration, faculty, and staff. Besides attitudinal conflicts, there may also be budgetary or political conflicts as well. The installation of an official task force to deal with AIDS issues on campus may be discouraged in fear that the existence of such a group somehow indicates a support for homosexual lifestyles; consequently, the seriousness of the AIDS crisis is downplayed (Caruso & Haig, 1987).

Caruso and Haig (1987) conducted a survey at 47 colleges in the Philadelphia area to assess their current efforts in AIDS education and their perspectives on how AIDS programs should be run on campus. Two colleges said that it was unnecessary for them to provide AIDS education to their students because they did not have dormitories or student health departments. One religious private college responded that it did not wish to overemphasize the AIDS issues because a discussion on premarital sex was not consistent with their

religious beliefs. All colleges should be encouraged to address AIDS related issues because their students are very much at risk for HIV infection due to their high levels of sexual activity (Caruso & Haig, 1987).

Condom availability. One strategy to promote the use of condoms among college students is to make the condoms more available and accessible on college campuses. Various departments on college campuses could distribute free condoms and campus stores stock condoms for sale. However, they are inaccessible once regular office hours are over. Sales of condoms through vending machines placed in restrooms and vending areas are important because they allow students to have anonymous access any time of the day or night.

Richwald and his colleagues (Richwald, Friedland, & Morisky, 1989) conducted a survey among the bookstore managers and student union directors at nine University of California campuses and 19 California State University campuses on the availability of condoms on their campuses. The results indicated that while there was a trend toward increasing the availability of condoms in college bookstores and campus convenience stores, condoms were available through vending machines in restrooms on a small percentage of the campuses. Furthermore, student union directors predicted that less than a half of their campuses would have condom vending machines installed in the restrooms in the future.

While the directors and managers cited buyer privacy and increased availability as reasons in favor of condom vending machines, they also cited

several obstacles. They were concerned with the high operational cost of vending machines due to vandalism and with the possible implication of tolerance to sexual activities where the machines are located. Half of the respondents feared condom sales might present a wrong image to campus visitors or local religious groups. Some felt that the responsibility for condom distribution did not belong to them but to other departments on campus. Finally, condom sales was a low priority issue for the university administration and for the campus in general (Richwald et al., 1989). The above findings seem to suggest that there is a need for the administration and other student service departments to become more aware of the serious and urgent nature of this epidemic for which many students are at risk. College campuses may then make condoms more accessible for students and help to promote the efficacy of AIDS education.

Faculty involvement. Another way to intervene at the institutional level in order to promote the efficacy of AIDS education is to increase the involvement of college professors in the educational process. They can be involved with the dissemination of AIDS information by making announcements concerning campus AIDS education programs and encouraging students to attend them. Professors can also be encouraged by the college administration to incorporate AIDS issues into their curriculum whenever possible (Dommeyer et al., 1989).

Student Attitudes and Receptivity

All of the health education theories described above stress the role of attitude in one's adaptation of recommended health behaviors. Without a

presence of favorable attitudes, one's receptivity and internalization of AIDS information as well as subsequent adoption of recommended health behaviors remain inadequate. The Health Belief Model (Janz & Becker, 1984) identifies a number of attitudinal factors necessary for increasing one's receptivity of suggested health behaviors, and they will be examined in relation to college students. These factors are: perceived susceptibility to AIDS, attitudes toward AIDS and homosexuality, and intentions and abilities to perform recommended behaviors. In addition, college students' developmental issues that have an impact on these attitude factors will also be addressed.

Perceived susceptibility. Perceived susceptibility is one attitude that seems to be related to students' internalization of AIDS knowledge. The Health Belief Model (Janz & Becker, 1984) has identified one's perceived susceptibility as a factor which modifies his or her sexual behavior to prevent HIV infection. Blonna et al. (1991) found that college students who considered themselves at risk for contracting HIV had higher rates of condom use to prevent infection. However, most students do not seem to consider themselves vulnerable to HIV infection. Adame et al. (1991) found that while 72% of their first year college student sample was afraid of contracting AIDS, over 55% considered themselves less likely than most people to contract the disease. Other studies (Bruce, Shrum, Trefethen, & Slovik, 1990; Fisher & Misovich, 1990; Roscoe & Kruger, 1990) found that college students generally believe that AIDS is a media hype or a concern for "everyone else," and it is not a problem they have to worry about.

Fisher and Misovich (1990) noted another pattern in students' perception of their vulnerability to AIDS. Students perceive greater risk as the targets of the disease are removed further from themselves. They believe that there is an increasing risk for contracting AIDS as one moves from the self, to the family, to friends, to other students at the university, and to society in general. This kind of belief (i.e., "it's someone else's problem") suggests an illusion of invulnerability and can have a dangerous consequence--lack of prevention. It has been hypothesized that this kind of belief is an attempt to mentally distance themselves from their risky sexual behavior by avoiding the acknowledgement of a possibility that they, too, are at risk of becoming infected with HIV (Fisher & Misovich, 1990; Sawyer & Beck, 1991).

Three factors may contribute to the belief of invulnerability to AIDS. One is the relatively low incidence of HIV cases in the heterosexual population. In the U.S., the AIDS epidemic has been evident primarily among minority groups, especially gay men and intravenous drug users. AIDS has been known to the public as a "gay disease" (Shilts, 1987), and if students do not identify themselves as a part of these minority groups, they may conclude that it is not a problem they need to be concerned with. The second factor is that although students know the kinds of behavior that place them at risk, the stigma attached to HIV infection is so overwhelming that they are not willing to categorize themselves as at-risk (Bruce et al., 1990). The third explanation for the belief in personal invulnerability is that most college students do not know anyone who has AIDS.

This fact helps students to experience the disease as something remote and distant from them (Roscoe & Kruger, 1990).

In a study by Goertzel and Bluebond-Langner (1991), a semester-long AIDS course at a university consisting of lectures, readings, recitation sections, and small group discussions significantly improved the knowledge and attitude about AIDS among the sample students, but their sense of vulnerability to the disease was unaffected. Increased knowledge did not bring an increased awareness of personal danger. Educational programs need to be designed to increase students' awareness of their vulnerability to AIDS and the need to modify their sexual behavior.

Attitude toward AIDS and homosexuality. A few researchers found that college students' attitudes about AIDS/HIV and persons living with AIDS/HIV were at "desirable levels" (Dommeyer, Marquard, Gibson, & Taylor, 1989; Scollay et al., 1992) and that AIDS education programs have had some impact on improving students' attitudes (Bellingham & Gillies, 1993). However, negative attitudes and fear toward AIDS and persons with AIDS prevail. In a study by Bellingham and Gillies (1993), 20 to 25% of students believed that AIDS patients should be quarantined. This kind of attitude may be a result of students misinterpreting the information about the transmission of HIV. Prominent fear is evident in one survey (Gaines, Iglar, & Michal, 1988) in which over one half of the college students indicated they would avoid residing in a dormitory if they suspected that a fellow resident had AIDS. Many felt that HIV-infected persons

had only themselves to blame (Bellingham & Gillies, 1993).

The theorists behind the Taxonomy of Educational Objectives (Bloom et al., 1964) believe that the more positive (i.e., accepting and tolerant) attitude one has about an illness, the more likely one is to modify his or her behavior in order to prevent such an illness. The attitudes many students have about AIDS are generally negative (i.e., fearful, hostile, and prejudicial). It is important to note that they do not seem to possess such attitudes toward other STDs and illnesses and persons living with them that are equally fatal and/or possibly more contagious (Sheehan, 1991). The elements that cause the college students to have different attitudes toward AIDS and AIDS patients must be identified and investigated.

Several studies have found that students' fear and intolerance of AIDS and persons with AIDS are positively correlated with fear and intolerance of homosexuals, more specifically gay men. The more negative the attitudes held about homosexuals, the greater the fear of AIDS and persons with AIDS (Bruce et al., 1990; Chng & Moore, 1991; Goertzel & Bluebond-Langner, 1991). Although the correlation does not prove a causal relationship between the two (i.e., negative attitudes toward gays lead to negative attitudes toward AIDS and HIV-infected persons), students' attitudes toward homosexuals may be an important factor influencing the effectiveness of AIDS education on college campuses; thus, further examination is warranted.

College students' negative attitude toward gays is evident in high

endorsement rates for survey statements like "I do not feel sorry for homosexuals who have AIDS since it is their own fault" and "AIDS is God's way of punishing homosexuals" (Bellingham & Gillies, 1993; Jacobs, 1993). Studies have discovered that this kind of attitude is more prevalent among male students (Chng & Moore, 1991; Fisher & Misovich, 1990; Goodwin & Roscoe, 1988).

Individuals with a more tolerant or accepting attitude toward homosexual behavior were considerably less afraid of AIDS and AIDS patients (Bruce et al., 1990; Goodwin & Roscoe, 1988). Bruce et al. (1990) found that tolerance and understanding about AIDS and people with AIDS were higher for students who personally knew a gay individual. Personal proximity and even casual contact with HIV-infected individuals have been identified as factors reducing the fear students have about AIDS and persons with AIDS. In fact, personal contact with an individual infected with AIDS has been a major determinant of behavioral change in preventing HIV-infection among gay men. The same result with heterosexual college students has been hypothesized (Fisher, 1988).

Gordin and his colleagues (Gordin, Willoughby, Levine, Gurel, & Neill, 1987) have identified the following factors associated with accepting and tolerant behavior and attitudes toward AIDS and AIDS patients: high degree of contact with AIDS patients, knowing people living with AIDS, older age, and higher level of education. Based on this list of factors, the odds of college students having these attitudes toward AIDS and AIDS patients are slim.

Despite recent educational efforts, AIDS is still strongly associated with

homosexuality. This association underscores the problem that AIDS is still being viewed as a result of homosexuality rather than understood as one of various STDs. Because of widespread homophobia on college campuses, AIDS education programs must include discussion not only on AIDS facts but also on students' attitudes toward AIDS and homosexuality. Addressing these issues is essential for increasing the knowledge and modifying sexual behavior among college students (Bruce et al., 1990).

Intentions and abilities to perform recommended behavior. The Theory of Reasoned Action (Ajzen & Fishbein, 1980) and the Taxonomy of Educational Objectives (Bloom et al., 1964) have identified the degree of one's intention to adopt the recommended behavior and the practical skills he or she has to adequately perform such behavior as factors contributing to the modification of health-related behavior. As discussed above, college students' intention to limit the number of sexual partners was not sufficient to produce a change in their behavior (Fisher & Misovich, 1990). Every college student may intend to prevent HIV infection and to live a healthy life; however, without the necessary skills, intentions are ineffective.

Roscoe and Kruger (1990) found students in their sample reporting that they were selective of their sexual partners or they had an intention to be selective of their sexual partners. One concern the researchers had, however, was how able their sample was to be "more selective." Some students looked for physical signs--blisters and lesions--and the partner was considered safe if he or she did not

appear to have a disease. Other students believed that the partner was safe if he or she was nice. Misconceptions such as these put students at risk no matter how much intention they may have to become selective of their sexual partners (Gold, Karmiloff-Smith, Skinner, & Morton, 1992; Roscoe & Kruger, 1990). Current AIDS education programs may not provide college students with the practical skills necessary to protect themselves from HIV infection.

In addition, an individual's perception of the efficacy of preventive behaviors has been associated with a greater degree of actual prevention efforts. How effective college students perceive AIDS preventive behaviors to be has great relevance to the way they acquire practical skills to practice safe sex, thus promoting their ability to perform health-behavior (Fisher & Misovich, 1990; Green et al., 1980; Janz & Becker, 1984).

Fisher and Misovich (1990) found that students tended to believe AIDS-preventive behavior could reduce their AIDS risk. When asked, "What is the likelihood that taking the proper precautions would reduce your chances of getting AIDS?" the average response in 1988 was 81% likelihood (on a 0-100% scale). This figure was up from 76% in 1987 and 67% in 1986. However, students' lack of perceived control over contracting AIDS remained. In response to the question, "What is the likelihood that you could contract AIDS, even if you took all the proper precautions?" an average 22% chance was reported in 1988.

Effective AIDS education programs include components that promote students' intentions to practice safe sex procedures and teach them practical skills

to adequately carry out such procedures. In addition, the educational efforts must be designed in such a way that students perceive the AIDS preventive behavior effective in protecting themselves from HIV infection. Some examples of practical skills are: making careful choices about sexual activity including consideration for abstinence or postponing sexual involvement in relationships, assertive communication with sexual partners and negotiation for safer sex, proper use of condoms, removal of alcohol and drugs from sexual activity, dealing with external pressure from peers or uncooperative sexual partners (American College Health Association, 1990a; Sheehan, 1991).

Developmental issues. The preceding discusses factors that are necessary in designing effective AIDS education programs according to major health education theories. However, Manning et al. (1989) believe that an additional factor, unaddressed by the theories, needs to be taken into account. They believe that students are struggling to resolve developmental issues particularly unique to this population and that this struggle makes the adoption of safer sex procedures very difficult.

Manning et al. (1989) identified the following adolescent developmental issues as factors which may push college students toward high-risk behavior for HIV infection despite their high levels of AIDS-related knowledge.

1. Identity versus role confusion. The most important task of adolescence is to discover who one is. Erikson (1950) describes this stage of life as "Crisis Five." Many undergraduates continue, and some complete, the search process for

self that began earlier in the teenage years. One's sexuality is an essential component of one's identity development.

2. Defining sex roles. Adolescence is often the time when sex roles are defined. College students of today may have a difficult time with the process of sex-role definition because it is an area of culture that has changed considerably in the last decade. The need to define both their sexuality and sexual roles may drive college students to experiment with sex.

3. Risk taking. Adolescence is a time of risk taking, particularly among males. Heavy drinking, drug use, staying up for "all-nighters," and unprotected sex with unknown partners are some ways in which many young people expose themselves to risks.

4. Egocentrism. A feature of egocentrism is the tendency to project personal danger onto others and believe that things can happen to other people but not to oneself. AIDS and death are common dangers projected onto others. Another feature of egocentrism is the orientation to the here and now. Although college students have the cognitive ability to imagine and predict the future, they often find the future irrelevant. The present is too powerful for retrospection or for projection into the future; thus, contracting HIV and/or dying in five to ten years is not a relevant concept for many undergraduates.

Although outwardly mature and self-assured, many college students are still trying to reach resolutions to these adolescent issues. The student who is still in a process of working through developmental tasks and is simultaneously involved in

sexual experimentation is unlikely to have the perspective necessary to employ preventive measures for HIV. Thus, it is possible that the college students' knowledge-behavior gap regarding AIDS prevention may be attributed largely to their developmental issues. AIDS education programs must become more sensitive to these issues to increase their efficacy.

Summary

In order to deliver effective AIDS education programs on college campuses, health educators need a great deal of support from their respective educational institutions. Most college students remain detached from the urgency of the current AIDS crisis. This phenomena may partially be attributed to the fact that educational institutions fail to recognize such urgency themselves. Students cannot be fully blamed for their detachment when the administrators of their colleges do not publicly acknowledge that their students are at risk for contracting a fatal virus. Health educators must educate the college administrators of their need to become involved in the educational process to help protect their students from AIDS. Once this task is successfully accomplished, the foundation has been laid for natural increases both in condom availability on campus and in the number of courses that include AIDS education components.

Students' perceived susceptibility to AIDS, their attitudes toward AIDS and homosexuality, their intentions and abilities regarding prevention, and developmental issues have been identified as elements that are related to students' receptivity and internalization of AIDS information. AIDS education programs,

therefore, must be sensitive to and make impacts on these elements in order to increase their efficacy.

Approaches to Close the Knowledge-Behavior Gap

In the preceding section, attitudinal factors and developmental issues were described that may be attributed to college students' knowledge-behavior gap regarding adoption of AIDS preventive behaviors. Can such a gap be closed by educational efforts or are the impeding factors too complex to intervene and overcome with education? Other education strategies have been proposed.

Peer Education

There is evidence that college students can close the knowledge-behavior gap in another health-related issue as a result of educational efforts, namely alcohol abuse. The research has shown that peer education programs to prevent alcohol abuse have been effective in teaching college students to adopt responsible drinking behavior. Peer education has also been significant in affecting behavioral changes among gay and bisexual men.

Alcohol abuse among college students. Alcohol education has a longer history than AIDS education and there are lessons to be learned. A review of literature on the efficacy of alcohol education programs reveals that they had the same problem as AIDS education programs--they were successful in increasing college students' knowledge levels but unsuccessful in causing behavioral changes. Studies have shown that students achieved significantly higher levels of knowledge

about alcohol use as a result of educational efforts and maintained such knowledge levels at follow-up intervals. However, it was also found that behavioral changes were more difficult to achieve (Engs, 1977; Portnoy, 1980; Robinson, 1981).

Lenhart and Wodarski (1984) maintain that a peer-group intervention is a preferred method for prevention of problem drinking among college students for the following reasons. First, young adults with drinking problems have been found to have poorer self-esteem and self-concept than non-drinking peers and often experience major psychological and social isolation. One's self-image can be strengthened and his or her ability to adopt and sustain certain behavior can be developed through the support of a sensitive and concerned peer group with similar problems. Second, group interactional situations provide a realistic environment for college students to test new behaviors and skills. This context provides them immediate feedback from peers regarding new problem solving skills and role models within the group to facilitate the acquisition of new, more appropriate behavior. Third, because of the influence peers have, groups provide a more potent means of changing college students' behavior.

In fact, one's perception of a peer norms appears to be influential in students' adaptation of health-related behavior. One's perception of social pressure and feedback from others that encourage or discourage his or her behavior change are theorized as factors that influence his or her adoption of recommended health-related behavior by the Theory of Reasoned Action (Ajzen

& Fishbein, 1980) and the PRECEDE Model of Health Education (Green et al., 1980), respectively. For college students, peers provide the most influential social pressure and their feedback greatly impacts one's likelihood to adopt health-related behavior.

In Rozelle's study (1980), a sample of college students were enrolled in a ten-week elective course. The class consisted of an hour-long lecture and an hour-long group session immediately following the lecture. The lectures were presented by guest speakers covering a wide range of topics related to alcohol use. Students' questions, comments, and rebuttals were encouraged. The small group sessions provided the students with an opportunity to further discuss the lecture topics. The groups were facilitated by trained undergraduate peer facilitators. The results at three months after the completion of the course showed that the experimental group displayed significantly higher levels of knowledge about alcohol ($p < .001$), significantly more responsible attitude toward drinking ($p < .001$), and significantly lower incidents of negative consequences experienced as a result of drinking ($p < .01$). Other alcohol education programs with a peer education component similar to Rozelle's have successfully helped college students to adopt more responsible drinking behavior (Caleekal-John & Pletsch, 1984; Russell, 1969; Tobler, 1992).

As illustrated above, alcohol abuse prevention programs containing a peer education component have been found effective in promoting behavioral changes among college students, thus have succeeded in closing the knowledge-behavior

gap. Such programs appear to have compensated for impeding factors that may be present by modifying students' perceived peer norms and helping the students to acquire new skills and behaviors. Can AIDS programs with a similar design prove themselves effective in helping college students to adopt safer sexual behavior to prevent HIV infection? Research in this area is scarce. What is known, however, is that peer education programs have been found effective in helping gay and bisexual men adopt safer sex behavior.

AIDS education for gay and bisexual men. There have been significantly more AIDS education efficacy studies with samples of gay and bisexual men than those with samples of college students. A number of studies demonstrated the effectiveness of AIDS education programs in helping gay and bisexual men change their behavior by manipulating their perceived peer norms.

In a recent study of 6,000 men entering gay bars in 16 small American cities, Kelly and his colleagues (1995) identified strong predictive factors of risky sexual behavior. One of the factors was the individual's sense of safer sex being an expected norm within his peer reference group. Other researchers have also found that perceived peer norms have had a great influence in the adaptation of safer sex procedures among gay and bisexual men (Kelly & Murphy, 1991; Remafedi, 1994; Tudiver et al., 1992). Educational efforts that include a peer education component have been successful in modifying sexual behavior in gay and bisexual individuals including that of young gay and bisexual individuals between the ages of 13 and 21 (Kelly & Murphy, 1991; Remafedi, 1994; Tudiver

et al., 1992).

The STOP AIDS Program is a community-based educational program that has successfully helped gay men to adopt safer sex behavior (Ostrow, 1989). The program uses an effective combination of coordinated media messages and small group meetings to promote peer norms for adoption of safe sex and individual behavioral change:

> The objective of these messages and meetings is to motivate participants to reexamine their own sexual behavior while simultaneously shifting community perceptions of normative behavior. This is achieved by the group session leaders, recognizable community leaders who are themselves struggling with issues related to AIDS prevention and life-style adaptation. Particularly emphasized are examinations of feelings associated with high-risk sexual behaviors and alternative behavioral responses to those feelings. Follow-up includes the mailing of newsletters to participants, invitations to follow-up group sessions, and, if a participant is highly motivated and completely aligned with project objectives, the invitation to become a group leader or a support volunteer. (Ostrow, 1989, p. 243)

Although there are no empirical data on the behavioral impact of the STOP AIDS Program, there has been a dramatic decline in unprotected anal intercourse and HIV infection among the gay and bisexual men in San Francisco where the program originated (Ostrow, 1989).

AIDS education for college students. There is evidence that college students' perceived peer norms are closely associated with their adoption of AIDS preventive behavior. Education programs that modify students' perceived peer norms are found to be effective in their behavioral modifications, thus effective in closing the knowledge-behavior gap.

Winslow and his colleagues (Winslow, Franzini, & Hwang, 1992)

investigated the relationship between perceived peer norms and risky sexual behavior among college students. The results indicated that the perceived AIDS-risk attitudes, motives, rationalizations, and behaviors of one's peer group are significantly correlated with both "condomless casual sex (one's engaging in sex with casual acquaintances or anonymous partners without condoms)" ($p < .001$) and with "resistance to change (one's resistance to change his or her sexual behavior in response to the AIDS crisis)" ($p < .001$). In agreement with other studies, one's level of AIDS knowledge did not correlate significantly with his or her engaging in condomless casual sex. One's resistance to change was not as strongly correlated to the level of AIDS knowledge ($p < .01$) as to the peer norms (Winslow, Franzini, & Hwang, 1992).

A multiple regression analysis of the above study showed that the peer norm factor was the strongest predictor of students' engaging in condomless casual sex. After the first step of the analysis in which the peer norm factor was added, the perceived risk factor and the perceived efficacy of health-related behavior factor became insignificant although they were significant in the correlation analysis. The difficulty with sex impulse control factor held its magnitude throughout the regression analysis. With the second dependent variable, "resistance to change," the peer norm factor again proved to be the strongest predictor. The perceived risk factor and the difficulty with sex impulse control factor held their magnitude relative to the peer norm factor through all steps of the regression analysis. In summary, the peer norms appeared to possess the

greatest magnitude as a predictor variable for both "condomless casual sex" and "resistance to change." Only the difficulty with sex impulse control factor, in predicting "condomless casual sex," and the perceived risk factor and the difficulty with sex impulse control factor, in predicting "resistance to change" were statistically significant as secondary variables. Knowledge regarding AIDS appeared to have no value as a predictor of either dependent variable (Winslow et al., 1992). The results of this study replicate other research findings that high knowledge levels do not translate into behavior modification (Baldwin & Baldwin, 1988; Fisher & Misovich, 1990; Sheehan, 1991). One's perceived peer norms, however, appear to have a significant impact on college students' engagement in certain sexual behavior.

Shulkin and her colleagues (Shulkin et al., 1991) evaluated the effectiveness of Project ACCEPT, a peer-education program designed to reduce high-risk sexual behavior, at a western university. Pre- and post-test questionnaires were utilized to measure changes in AIDS-related knowledge and attitude as well as in intentions regarding sexual behavior. The intervention of Project ACCEPT included a didactic portion in which AIDS information was presented. This accounted for one half of a session. The other half allowed time for peer health educators to facilitate group discussions and model ways for the students to discuss condom use with their sexual partners. During the group discussion, students commented frequently and asked a variety of questions. In addition, peer educators demonstrated the proper way to use condoms and provided referral

numbers for additional AIDS information, resources for HIV-testing and counseling, and literature with suggestions for condom negotiations. The results indicated a significant increase in students' intentions to practice safer sex as well as significant improvement in knowledge and attitude for the experimental group in relation to the control group.

Richie and Getty (1994) conducted a qualitative study, using a small sample size, of an AIDS peer education program (APEP) targeted at first year students in a southeastern university. The results revealed that some actual behavioral changes took place among students during the first year of their university experience. Those who attended an APEP were more likely than those who had not attended to report having had an HIV-antibody test during the first school year. They were also more likely to begin using condoms by the end of the school year. Furthermore, those who attended were more likely to report an intention to change their sexual behavior than those who did not in the following areas: asking a new sexual partner about his or her previous partners, asking a new partner to be HIV-tested before having sex, asking a new partner to remain monogamous, asking a new partner to avoid using drugs or alcohol if the partner thought he or she might be having sex later, and stopping sexual activity while a partner went to get a condom if no condom was available.

Additional Approaches

It appears that health educators have many tasks to accomplish in order to increase the efficacy of AIDS education. So far, the discussion has been focused

around identifying theoretical factors that are lacking in ineffective AIDS education programs and designing programs that are sensitive to these factors as well as to college students' developmental issues. Now the focus will shift to some factors that may be practical in planning effective AIDS education programs. These factors are: characteristics of educators, relationship emphases, specifying target populations, education for homophobia, use of HIV testing as a means of education, and education on women's health issues.

Characteristics of educators. An important factor for successful AIDS education may be the characteristics of the educators. In the field of social psychology, it has been accepted that the more credibility, attractiveness, and attributed power a speaker has, the more likely that the message will be accepted by the audience. Highly credible educators are more successful in promoting attitude change than less credible educators (Scollay et al., 1992). Educators should be sensitive but direct and explicit. They must have an ability to continue accepting the students no matter who they are or what they have experienced. Furthermore, it is essential that the educators speak to the students in their own language. Effective educators, therefore, avoid the use of confusing jargons, euphemisms, and abstract terminology such as "casual contact," "bodily fluids," and "vaginal secretions" (Roscoe & Kruger, 1990; Scollay et al., 1992).

There is evidence that AIDS education programs presented by HIV-positive speakers are highly effective. One survey shows that students prefer HIV-positive speakers second to physicians as AIDS education providers (Manning et

al., 1989). People are more likely to change their behavior when they are emotionally moved and feel differently through emotional involvement with the speaker. Such emotional involvement may often take place when the educator is infected with HIV. One study (Scollay et al., 1992) compared the impact of two speakers--one revealed an HIV seropositive status to the experimental group and the control group speaker did not reveal an HIV status. Results showed that students in the experimental group were significantly more motivated to use condoms than students in the control group. The researchers suggest that two factors contributed to such an impact. First, the HIV-positive speaker challenged the misconception that a person who is HIV infected is visually identifiable. Secondly, the HIV-positive presenter's first-person account personalized the AIDS epidemic, thus increasing the students' sense of personal susceptibility to AIDS.

Relationship emphases. A logical response to the current AIDS crisis would be that students form longer-lasting monogamous relationships. The fewer people a person becomes involved with sexually, the less risk the person incurs of contracting HIV. However, Fisher and Misovich's study (1990) of a series of cross-sectional samples from year to year over three years revealed that college students' pattern of relationships had not changed. The results showed that most of the students who were in relationships had been in them for relatively short periods of time--eight percent for one month or less, 34% for six months or less, and 53% had been in their present relationship for a year or less. Furthermore, 40% did not have any idea how much longer their relationship would last, eight

percent thought it would last less than six months, four percent thought it would last from six months to one year, and 45% thought it would last a "long time" or would lead to marriage. No consistent pattern of change was observed when this data was compared to previous years. It is suggested that college students be encouraged to establish intimate relationships on a longer-lasting basis and this point be regularly included as an essential part of AIDS education programs.

Abstinence is the best known method to prevent HIV infection. However, because college years are often the time when sexual experimentation takes place, some researchers believe that expecting college students to maintain abstinence is highly unrealistic. It has been discussed that many college students may be lacking the practical skills necessary to translate their knowledge into behavioral modification. Thus, it is critical that health educators teach their students how to practice safer sex and how to verbally communicate with their sexual partners about safer sex (Roscoe & Kruger, 1990).

In fact, Fisher and Misovich (1990) have observed that college students are becoming less embarrassed to raise the issue of safer sex with their sexual partners. Female students are less likely than male students to feel embarrassed about discussing "safer sex" with their partners. Both males and females are concerned about HIV infection and they would not feel insulted but instead would feel relieved if their partners brought up the topic. Therefore, it is reasonable to incorporate the topic of safe sex communication in peer education programs. Based on the data, female students may be encouraged to initiate this kind of

discussion more, without suggesting that it is their responsibility to raise the issue. Students also need to be made aware that they have the power to be in control of their sexual behavior, and they are responsible for themselves. Empowerment, assertiveness, and negotiation skills, therefore, need to be promoted. A technique that may be effective in accomplishing these goals is role playing the safer sex communication in a hypothetical situation (Roscoe & Kruger, 1990).

Specifying target populations. Approaches that are targeted at specific populations have been suggested as a means to increase the efficacy of current AIDS education programs. As described earlier, AIDS education programs designed especially for the gay community have resulted in the most profound change of health-related behaviors ever recorded. The STOP AIDS Program and the Project ARIES are examples of such programs (Scollay et al., 1992). Other factors that require special attention of health educators are the target population's age, culture, gender, and level of previous sexual experience (DiClemente, Boyer, & Mills, 1987; Severn, 1990).

Sexually inactive and sexually less experienced individuals may be a subpopulation that can be a target of AIDS education on college campuses. Sexually inactive students are significantly more likely to maintain their abstinence than are sexually active students to adopt abstinence (Hernandez & Smith, 1990). In addition, Severn (1990) found that college students with little sexual experience (less than one year), when compared with those with extensive sexual experience (eight or more years), are more anxious, more willing to seek information on

AIDS and more eager to modify their behavior to reduce the risk of HIV infection. Furthermore, Sawyer and Beck (1991) exposed a sample of college students with two types of AIDS education films--traditional, medically factual and emotionally provocative type. The latter type of film produced a significant increase in perceived susceptibility to HIV, especially among those who identified themselves as not yet sexually active. AIDS education may be most effective in increasing awareness of personal vulnerability to HIV infection for students who are not yet sexually active since there is evidence that the more sexually experienced one is, the less vulnerable one feels to infection and the less likely to use condoms (Severn, 1990). One strategy for more effective AIDS education, therefore, is to start exposing students to AIDS education as early as possible--even at prepubescent age.

Education for homophobia. As described above, an individual's attitude toward homosexuality is related to his or her attitude toward AIDS and the likelihood of adopting safer sexual behavior. Thus, educational efforts aimed at decreasing college students' homophobic attitude appears to be a vital component in an attempt to raise the students' likelihood of practicing safer sex. Studies show that the impact AIDS education programs has upon students' attitude toward homosexuals has been mixed. In one study (Chng & Moore, 1991) students' homophobic attitudes were not affected by listening to an AIDS education presentation by a gay and lesbian panel. In another study (Goertzel & Bluebond-Langner, 1991) a sample of students went through an AIDS education

course. In the experimental group, students' homophobia was significantly decreased (but not eliminated) from a level of "mildly homophobic" to "neutral." There was no significant change in the control group.

It can be safely concluded that it is difficult to change college students' attitudes and beliefs about homosexuality in a short amount of time. "One-shot deals" such as a single AIDS education seminar or one semester-long AIDS education course are generally ineffective in helping students to change their attitudes (Chng & Moore, 1991). These attitudes were formed over a long time and require interventions over a long time to be altered. The modification of attitudes toward homosexual individuals, therefore, requires continuous interventions. While it is important to include students' attitude toward homosexuals as a component of AIDS education, the issue may need to be addressed separately, especially in light of the increasing trend toward violence against homosexual individuals.

HIV testing. Every AIDS education program should include information on the HIV-antibody test. It is essential that college students are aware of the risks, benefits, and significance of undergoing such a test. They need to become aware of how test results are processed and handled including specific information on the circumstances under which the results may be revealed to others. Students need to become familiar with the availability of HIV testing and with the facts about the test so that each student can make an informed choice about utilizing the test (Ross & Rosser, 1989).

Ross (1988) supports the use of the HIV-antibody test as a form of education to promote a change in college students' sexual behavior. In a sample of homosexually active men, subjects were tested for HIV and counseled, just tested, just counseled, or received no intervention. It was discovered that all interventions resulted in significant reduction in at-risk behaviors. The effect was greatest in the group that received both testing and counseling, followed by lesser effects in the groups receiving counseling only and then testing only. Furthermore, it was also found that distribution of free condoms at the testing site was associated with increased condom use among a sample of homosexually active men compared to those who were not given free samples. The data suggest that HIV testing may be an effective tool to help modify behavior, especially when it is combined with face-to-face counseling (Ross, 1988). The generalizability of the effectiveness of this intervention to heterosexual college students is uncertain and warrants further research.

Broader health issues. All college students would benefit from AIDS education programs that include information on the multiple health problems they may face because of unprotected sexual behavior. Most students may not be aware of these health complications. Casual and risky sex can, of course, increase the risk of STDs, unwanted pregnancies, and abortions. But unprotected sex can also lead to increased risks for women to contract pelvic inflammatory disease, infertility, or ectopic pregnancies later in life. Students should be encouraged to consider the consequences of their risky sexual behaviors upon their partners and

to become more considerate of their sexual partners (Baldwin & Baldwin, 1988).

Heightening the awareness of sexually active college students for possible non-AIDS health complications caused by their own sexual behaviors may help to increase their sense of personal vulnerability to STDs in general. This may prove to be more effective than simply attempting to raise a sense of personal vulnerability to AIDS only. Thus, presenting an education program including these non-AIDS health issues may be more effective than conventional AIDS education programs (Baldwin & Baldwin, 1988).

Summary

Perceived peer norms have been identified as a influential element in closing the knowledge-behavior gap regarding AIDS preventive behaviors. Inclusion of a peer education component that modifies college students' perceived peer norms, therefore, has been suggested as an intervention method of choice for future education efforts. Peer education programs have been found effective in modifying drinking behavior among college students and sexual behavior among gay and bisexual men. Preliminary studies on peer-based AIDS education programs indicate that one's perception of peer norms is indeed an important factor in predicting students' adoption of safer sex procedures. Thus, peer programs that are designed to change students' perceived peer norms about practicing safer sex appear to compensate for impeding factors and make the current AIDS education more effective.

A number of additional approaches to close college students' knowledge-

behavior gap have been proposed. Educators must be able to relate to students and to speak their language. HIV-positive educators, in particular, may be able to produce positive outcomes by challenging students' misconception and sense of invulnerability. Promoting long-term, monogamous relationships and discussions on safer sex issues between partners needs to become a part of AIDS education programs regularly. Identification of target populations is crucial in designing effective education programs, especially in light of evidence that sexually inexperienced college students are more likely to adopt HIV-preventive behaviors. Continued efforts to change students' homophobic attitudes are proposed because such attitudes are found to be related to their resistance to change students' at-risk behaviors. Finally, information on HIV testing and broader health issues related to one's sexual activity must be regularly incorporated in AIDS education programs.

Conclusion

College students are highly knowledgeable of the methods of transmission and prevention of AIDS. The first phase of AIDS education--dissemination of AIDS information and acquisition of adequate knowledge by students--has, therefore, been successful. Students, however, possess an inaccurate belief that HIV can be contracted through casual contact. In addition, they have not changed their sexual behaviors that place them at risk to AIDS. Knowledge alone has not helped students to refrain from at-risk behaviors: having multiple sex

partners, becoming involved with unfamiliar sex partners, having unprotected sex, and using alcohol and drugs.

The second phase of AIDS education is intervention aimed at students' attitudes and beliefs: perceived susceptibility, attitude toward AIDS and homosexuality, and intentions and abilities to perform recommended behavior. Support by college administration is an important element to bring forth changes in students' attitudes and beliefs. In addition, many students may still be in the process of resolving adolescent developmental issues that may impede the adoption of recommended behaviors. Helping students to acquire practical skills to alter risk behavior, thus closing the knowledge-behavior gap, is the third stage of AIDS education. Many of the AIDS education programs have had limited success in achieving the goals of the second and third phases.

Programs containing both didactic lectures and peer group discussion sessions appear to be the most promising method of intervention to close the knowledge-behavior gap. The perception of peer norms has been identified as one of the most influential factors in college students' behavioral modification. The peer education component of AIDS education appears to effectively modify students' perceived peer norms on attitudes about safer sex issues and provide students with specific skills to help change their high-risk behaviors.

A number of additional approaches to close the knowledge-behavior gap have been noted. They are: characteristics of educators, relationship emphases, specifying target populations, education for homophobia, use of HIV testing as a

means of education, and education on broader health issues. Educating and helping college students change their behavior in response to the AIDS crisis is a difficult task requiring consideration for all the factors described above.

Future Research Challenges

Based on the present literature review, a number of future research objectives have been identified. They are: development of a new health education theory, more focused studies, and consideration of characterological issues.

New health education theory. Ross and Rosser (1989) suggest a modification of the current health educational theories to better address the AIDS epidemic. They point out that current theories are designed based on correlations between health behaviors and the occurrence of certain diseases. For example, a decrease in the amount of smoking and high-fat diets will reduce the risk of lung cancer and heart diseases, respectively. The nature of transmission of AIDS is qualitatively and quantitatively different. First, AIDS and other infectious diseases take only one contact for infection. Thus, behavioral change must be immediate and complete. Second, because HIV infection is highly stigmatized, change in attitudes may have a large part in changing behaviors. Third, because behaviors most closely related to HIV infection are sexual and drug-related, they are heavily invested psychologically (Ross & Rosser, 1989).

Many researchers who study the efficacy of AIDS education refer to the factors outlined in the Health Belief Model as a guide to design their research in investigations of college students' modification of their sexual behaviors. Some

researchers have concluded that the Health Belief Model components do not accurately explain behavioral change, or lack thereof, in response to the current AIDS crisis among college students (Bruce et al., 1990) and among gay and bisexual men (Montgomery et al., 1989) in response to the AIDS threat. Scollay et al. (1992) assert that the Health Belief Model may have outlived its usefulness in educating college students about AIDS. The development of a new health education theory that better addresses AIDS-related health behavior, therefore, seems essential.

Focused studies. Most, if not all, of the AIDS education efficacy studies at present have focused on investigating factors associated with limited success of educational efforts. There appears to be no currently available study with subjects who are able to maintain abstinence and/or delay sexual involvement in relationships in response to the AIDS crisis. Isolating and identifying any factors that contribute to these favorable behaviors may greatly benefit in formulating a new health education theory as well as in defining a future direction of AIDS education. More research on individuals who can maintain their abstinence and/or delay gratification is, therefore, proposed.

Most of the studies reviewed assessed students' intentions of adopting recommended sexual behavior in response to various educational efforts. However, little is known about whether students' actual sexual behavior is significantly impacted by current AIDS education. Students may intend to change their sexual behavior at the time when post-intervention questionnaires are

administered, but their intentions may not be followed through. To attain a more accurate picture on the efficacy of current AIDS education efforts, it is crucial that researchers collect more data on students' actual, post-intervention sexual practices, and not only their intentions to practice safer sex. Consequently, more longitudinal research must be conducted in order to assess the students' actual behavioral change and the retention rate of such behavior modification.

A consistent problem in most of the studies surveyed was researchers' failure to accurately define risky sexual behavior. Researchers tend to give a label "risky" if a student is not using a condom every time he or she engages in sex. This may be a valid assumption in most cases. However, if a student has only one sex partner and knows that the partner is HIV-negative, having sex without a condom would be considered safe. Furthermore, mutual masturbation is also considered a safer sex behavior that does not require the use of condoms (American College Health Association, 1990b). Only one study (Winslow et al., 1992) among all sexual behavior studies surveyed made an attempt to be precise about defining unsafe sex. Future research on the effectiveness of AIDS education, therefore, must include more accurately stated definitions for risky sexual behavior.

Efficacy of education programs targeting the college population would be enhanced by further investigation into the students' ways of conceptualizing AIDS and their cognitive processes in making decisions about engaging in risky behaviors. How students resolve the conflict that may arise from contradictory

judgments--being aware that unprotected sex puts one at risk for AIDS while engaging in such behavior at the same time, for example--needs to be studied. The answers to such questions will enhance the efficacy of AIDS education efforts (Sheehan, 1991).

Psychodynamic perspective. The limited success of AIDS education efforts with college students is a result of the knowledge-behavior gap or what can be called "paradoxical behaviors," that is, students are continuing to engage in behaviors that they know can be harmful or even fatal to them. Currently available literature on AIDS education efficacy does not cite characterological issues as a possible factor that contributes to students' resistance to changing their sexual behaviors. If such issues are playing a role in students' lack of behavior modification, conventional educational approaches may not be adequate to compensate for these issues. While no theory is currently available to explain students' engaging in risky sexual activities, psychodynamic theories attempt to explain substance abuse, also a paradoxical behavior, in terms of characterological issues.

From a psychodynamic perspective, vulnerabilities in ego and self structures that regulate self-esteem, self-care, and capacity to relate to others are at the root of substance abuse. Substance abuse is both an expression of vulnerability or deficiency in self-regulation, and an attempt to overcome this vulnerability. It is a way to manage psychological suffering and to temporarily achieve a better adaptation to life. Substances are used to relieve the painful affects and suffering

that derive from deficits in ego capacities, in the sense of self, and in object relations (Khantzian, Halliday, & McAuliff, 1990).

Kohut (1994) shifts the focus of the vulnerability to narcissistic disturbance. He describes the vulnerability as a "defect in the self." Because one cannot adequately supply the self with self-approval or with a sense of strength from inner resources, a narcissistically disturbed individual craves praise and approval or a merger with an idealized object. Use of substances gives him or her the feeling of being accepted, self-confident, strong, and worthwhile. It offers an illusory resolution of the deficit by modifying the painful affects associated with the defect in the self. Substance use offers something the person denies or is unable to provide the self such as feelings of competence and strength. Substance abuse represents a view of the self that is invested in remaining weak, incompetent, and helpless without drugs (Khantzian, Halliday, & McAuliff, 1990).

If college students were using the mood altering effects of sex to manage the psychological suffering caused by a defect in the self, conventional educational approaches to change their sexual behaviors may not be adequate because current AIDS education approaches do not address these issues. Psychologically therapeutic interventions may be more appropriate for these students. Research is, therefore, needed to determine to what extent students' resistance to change their sexual behavior can be attributed to their characterological issues.

Significant information has been gained by evaluative research of AIDS education programs for two identified risk groups--gay/bisexual men and

intravenous drug users. Similar research with college students lags behind. Research is needed that addresses students' positive response to the AIDS crisis, their behavior after interventions, and their paradoxical behaviors and decision making processes. With the increased HIV infection and death rates among young adults, more effective AIDS education programs for college students and adolescents and continued research to evaluate such programs are desperately needed.

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VITA

NAME:

Motomi Sugahara

EDUCATION:

Rosemead School of Psychology Clinical Psychology	Psy.D.	(Cand.)
Rosemead School of Psychology Clinical Psychology	M.A.	1991
Baylor University Psychology	B.A.	1989

INTERNSHIP:

Counseling Center University of California, Irvine Irvine, California	1994 -	1995

PRACTICA:

Biola Counseling Center Outpatient Program	1991 -	1993
Camarillo State Hospital Inpatient Program		1991
Hacienda/La Puente Unified School District Child/Adolescent Program		1991
Irvine Unified School District Child/Adolescent Program	1990 -	1991

EMPLOYMENT:

Biola Counseling Center Staff Therapist	1993 -	1994